In the Claims

1. (Previously Presented) A current sensing system comprising:

a conductor configured to receive current flow therethrough and generate magnetic flux thereabout, at least a portion of the conductor configured as a helix shaped flux concentrator to concentrate magnetic flux induced by current flow through the conductor; and

an anti-differential current sensor configured to monitor magnetic flux about the conductor.

2. (Previously Presented) The current sensing system of claim 1 wherein the anti-differential current sensor includes at least two Hall effect sensors disposed proximate the conductor and a processing component configured to receive feedback from the at least two Hall effect sensors and generate an anti-differential output to substantially remove feedback generated responsive to magnetic flux induced externally from the conductor.

3. (Original) The current sensing system of claim 2 wherein the processing component includes at least one of a summing amplifier and a differential amplifier.

4. (Previously Presented) The current sensing system of claim 1 wherein the helix-shaped flux concentrator includes a spiral conductive path configured to receive the current flow from the conductor and wherein the anti-differential current sensor includes at least one magnetic flux sensor disposed proximate the at least one spiral conductive path to detect magnetic flux induced by the current flow through the conductive spiral path.

5. (Previously Presented) The current sensing system of claim 1 wherein the helix-shaped flux concentrator includes a first spiral conductive path having a first directional spiraling and a second spiral conductive path having a second directional spiraling and wherein the first directional spiraling and the second directional spiraling are substantially opposite in direction.

6. (Previously Presented) The current sensing system of claim 5 further comprising a first Hall effect sensor configured to monitor magnetic flux concentrated by the first spiral conductive path and a second Hall effect sensor configured to monitor magnetic flux concentrated by the second spiral conductive path.

7. (Original) The current sensing system of claim 6 wherein the first Hall effect sensor is configured to provide feedback indicating a magnitude and direction of current flow through the first spiral conductive path and the second Hall effect sensor is configured to provide feedback indicating a magnitude and direction of current flow through the second spiral conductive path.

8. (Previously Presented) The current sensing system of claim 7 further comprising a processing component configured to calculate one of a sum and a difference of the feedback from the first Hall effect sensor and the second Hall effect sensor to generate an indication of current flow through the first spiral conductive path and the second spiral conductive path.

9. (Previously Presented) The current sensing system of claim 1 wherein the conductor includes a wire.

10. (Original) The current sensor of claim 1 wherein the helix-shaped flux concentrator includes at least one flux concentrating recess disposed within the conductor and configured to concentrate magnetic flux about the at least one flux concentrating recess.

11. (Original) The current sensor of claim 10 wherein the anti-differential current sensor includes at least one Hall effect sensor configured to be disposed within the at least one flux concentrating recess.

12. (Original) The current sensor of claim 10 wherein the at least one flux concentrating recess includes two recesses oppositely disposed within the conductive path.

13. (Original) The current sensor of claim 10 wherein the conductive path includes at least one of a wire and a bus bar having a pair of flux concentrating recesses therein disposed on opposite sides thereof.

14. (Previously Presented) The current sensing system of claim 1 wherein the anti-differential current sensor and helix-shaped flux concentrator are substantially free of

ferromagnetic flux concentrating materials and wherein the helix-shaped flux concentrator is arranged in one of a dual-helix and a quad-helix configuration.

15. (Previously Presented) The current sensing system of claim 1 wherein the helix-shaped flux concentrator includes a spiraled wire forming a portion of the conductor.

16. (Previously Presented) A current sensor comprising:

at least one spiraled-helix conductive path configured to receive a current flow therethrough and concentrate magnetic flux induced by the current flow through the at least one spiraled-helix conductive path;

at least one Hall effect sensor positioned proximate to the at least one spiraled-helix conductive path and configured to sense the concentrated magnetic flux and provide a signal indication of the current flow through the at least one spiraled-helix conductive path; and

wherein the at least one spiraled-helix conductive path includes a first spiraled conductive path having a first Hall effect sensor positioned proximate thereto and a second spiraled conductive path having a second Hall effect sensor positioned proximate thereto.

17. (Previously Presented) The current sensor of claim 16 wherein the at least one Hall effect sensor is configured to provide a determination of a magnitude and direction of current flow through the at least one spiraled-helix conductive path.

18. (Canceled)

19. (Original) The current sensor of claim 18 wherein the first spiraled conductive path includes a first direction of spiraling and the second spiraled conductive path includes a second direction of spiraling and wherein the first direction of spiraling and the second direction of spiraling are substantially opposite in direction.

20. (Previously Presented) The current sensor of claim 18 further comprising a processor configured to receive magnitude and direction feedback from the first Hall effect sensor and the second Hall effect sensor and generate an anti-differential output from the magnitude and direction feedback to substantially offset magnitude and direction feedback not induced by the current flow through the at least one spiraled-helix conductive path.

21. (Original) The current sensor of claim 20 wherein the processor is configured to generate the anti-differential output by calculating one of a sum and a summed difference from the magnitude and direction feedback.

22. (Original) The current sensor of claim 18 wherein the first Hall effect sensor and the second Hall effect sensor are selected to reduce errors attributable to Hall gain drift and Lorentz force drifts.

23. (Previously Presented) The current sensor of claim 16 wherein the at least one Hall effect sensor and a second Hall effect sensor are disposed within the at least one spiraled-helix conductive path.

24. (Original) The current sensor of claim 16 wherein the current sensor is substantially free of ferromagnetic flux concentrating devices.

25. (Previously Presented) A current sensor system comprising:

a conductor configured to receive a current flow;

an anti-differential current sensor configured to monitor the current flow through the conductor; and

wherein the conductor is arranged according to a helix topology.

26. (Original) The current sensor system of claim 25 wherein the at least one flux concentrating recess includes opposing flux concentrating recesses and wherein the anti-differential current sensor includes Hall effect sensors disposed within the opposing flux concentrating recesses within the conductor.

27. (Original) The current sensor system of claim 26 wherein the matched Hall effect sensors are configured to provide feedback to a processing device and wherein the processing device is configured to generate an indication of current flow through the conductor that is substantially free of Hall effect specific errors.

28. (Original) The current sensor system of claim 27 further comprising an amplifier configured to generate at least one of a sum and a summed difference of the feedback to substantially cancel feedback generated by the matched Hall effect sensors in response to detecting magnetic flux induced externally from the conductor.

29. (Previously Presented) The current sensor system of claim 25 wherein the conductor includes a wire.

30. (Original) The current sensor system of claim 25 wherein the anti-differential current sensor is substantially free of ferromagnetic flux concentrating materials.

31. (Previously Presented) A method of making a flux concentrating current sensor system comprising:

configuring a conductive path to form a helix-shaped flux concentrating means to concentrate magnetic fields;

disposing a pair of ferromagnetic-free current sensors in proximity to the flux concentrating means to detect the concentrated magnetic fields; and

configuring an anti-differential calculator to receive feedback from the pair of ferromagnetic-free current sensors and generate an indication of current flow through the conductive path that is substantially free of errors due to magnetic fields generated externally from the conductive path impinging upon the pair ferromagnetic-free current sensors.